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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/697,570	10/26/2000	Shinya Matsuda	15162/02660	4859

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EXAMINER

CUEVAS, PEDRO J

ART UNIT	PAPER NUMBER
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2834

DATE MAILED: 06/05/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/697,570

Applicant(s)

MATSUDA ET AL.

Examiner

Pedro J. Cuevas

Art Unit

2834

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 April 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1-12 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,696,421 to Zumeris et al. in view of U.S. Patent No. 6,201,340B to Matsuda et al.

Zumeris et al. clearly teaches the construction of an actuator (40) for moving a driven member (42), said actuator comprising:

- a displacement element (60) for producing a specific displacement;
- a drive member (64) connected to one end of said displacement element and which transfers the displacement of said displacement element to a driven member;
- a stationary member (62) which supports the other end of the displacement element; and
- a drive circuit for driving said displacement element, which is not shown but is inherent (see applied voltage waveforms in Figures 7A & 7B).

However, it fails to disclose an actuator having a compression member for pressing said driven member against the drive member such that the drive member and the driven member are in a state of intermittent contact under conditions near the condition of transition from the intermittent contact state to a normal contact state, and a second displacement element for

producing a second specific displacement having a direction which has a predetermined angle to a direction of the first specific direction of said first displacement element.

Matsuda et al. teaches the construction of a compression member (20) for pressing said driven member against the drive member such that the drive member and the driven member are in a state of intermittent contact under conditions near the condition of transition from the intermittent contact state to a normal contact state, and a trust type actuator having two piezoelectric devices provided for crossing at right angle for the purpose of driving in a precise electronically controlled manner, a multiple axis rotational member or rotor by using a combination of predetermined elliptical trails.

It would have been obvious to one skilled in the art at the time the invention was made to use the trust type actuator disclosed by Matsuda et al. on the actuator disclosed by Zumeris et al. for the purpose of driving in a precise electronically controlled manner, a multiple axis rotational member or rotor by using a combination of predetermined elliptical trails instead of a common uncontrolled bearing assembly.

4. With regards to claims 2 and 8, Zumeris et al. discloses the claimed invention except for the relationship:

$$N_t = XO * ((1 / (1/k_2 + 1/k_3)) - (1 / (1/k_1 + 1/k_2 + 1/k_3)))$$

where k_1 is the spring constant of the compression member, k_2 is the combined spring constant of the displacement element and the drive member, k_3 is the spring constant of the driven member, XO is the amount of displacement of the displacement element, and N_t is the compression force applied by the compression member.

It would have been obvious to one skilled in the art at the time the invention was made to use the previously stated mathematical expression, which is nothing more than the standard

formula to calculate the force of a spring, including the variables of the specific case at hand, for the purpose of determining the actual performance of the claimed invention.

5. With regards to claim 3, Zumeris et al. discloses that the actuator repeats it's periodic motion at high frequencies such as 20-150 KHz, as stated in lines 33-44 of column 4.

6. With regards to claim 4, Zumeris et al. discloses that the actuator repeats it's periodic motion at high frequencies such as 20-150 KHz, as stated in lines 33-44 of column 4.

7. With regards to claim 5 & 6, Matsuda et al. discloses an actuator wherein:

said displacement element is a laminate type piezoelectric element; and

said displacement element includes alternating layers of a plurality of

piezoelectric thin plates and electrodes,

as shown in Figure 1.

8. With regards to claims 9 and 10, Zumeris et al. discloses that the actuator repeats it's periodic motion at high frequencies such as 20-150 KHz, as stated in lines 33-44 of column 4.

9. With regards to claim 11 & 12, Matsuda et al. discloses an actuator, wherein said displacement element is a laminate type piezoelectric element and said displacement element includes alternating layers of a plurality of piezoelectric thin plates and electrodes as shown in Figure 1.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. See PTO-892.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pedro J. Cuevas whose telephone number is (703) 308-4904. The examiner can normally be reached on M-F from 8:30 - 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Néstor R. Ramírez can be reached on (703) 308-1371. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-1341 for regular communications and (703) 305-3432 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Pedro J. Cuevas
June 3, 2002



NESTOR RAMIREZ
SUPERVISORY PATENT EXAMINER
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